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DE LAVAL WHEY SEPARATORS

TURN WASTE INTO PROFIT

DE LAVAL WHEY SEPARATORS

Prevent the loss of butter-fat, which is worth
more today than ever before

Insure the pigs or other young stock getting the
chief feeding elements of the whey in the
best condition

Improve the quality of the milk delivered to the
factory

Make patrons' cans and the whey vat much
easier to keep clean

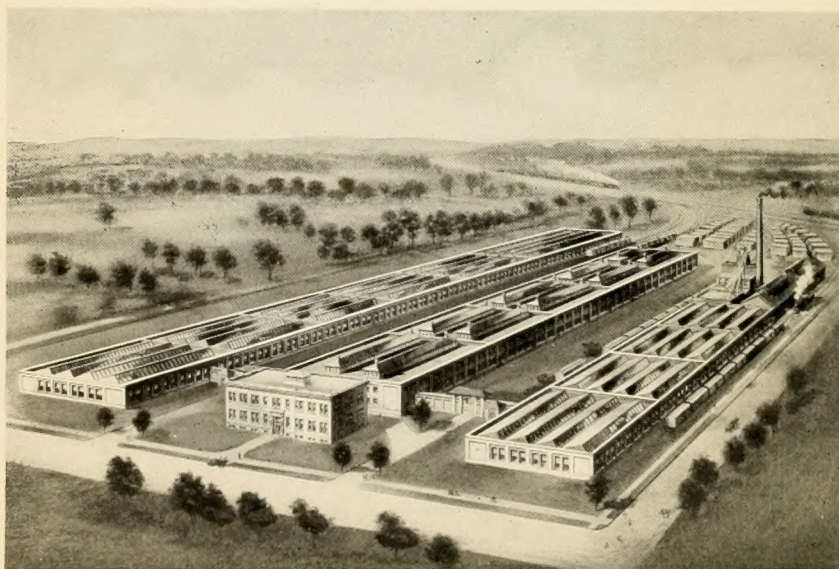
THE DE LAVAL SEPARATOR COMPANY
NEW YORK CHICAGO SAN FRANCISCO

WORLD'S LARGEST MAKERS OF CENTRIFUGAL MACHINERY

SF247
J55



General American Works of The De Laval Separator Company, Poughkeepsie, N. Y.



General Canadian Works of The De Laval Company, Limited, Peterboro, Ontario

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APR 21 1920

DE LAVAL WHEY SEPARATORS

THE De Laval Whey Separator, a centrifugal machine especially designed for the purpose, recovers most completely, most quickly and most economically the butter-fat from whey, thus at once putting a stop to a big waste in cheese factories and converting it into handsome profit. In hundreds of cheese plants throughout both North America and Europe, De Laval Whey Separators are adding thousands of dollars annually to the profits of the owners and patrons.

Introduced only a few years ago to meet the demand of a number of progressive cheese factories which were dissatisfied with the then existing methods of skimming whey, the De Laval Whey Separator has paid such large money returns from whey cream that it is now an indispensable part of the standard equipment of every up-to-date cheese factory.

Cream produced by De Laval Whey Separators or butter made from De Laval-separated whey cream brings substantially the ruling price in any market. Cheese factories have no difficulty in selling all the whey cream or whey butter they can turn out, generally right at home.

Within the last few years the demand for De Laval Whey Separators has grown with remarkable rapidity, cheese factories having begun to profit by the example of manufacturers generally in eliminating waste and making use of all by-products. Cheese plants are turning to their own advantage the experience of the packing industry, for example, which now makes more money on a steer's hide, hoofs, horns and hair than on its meat. Cream prices have reached the level where cheese factories can see that fat no longer can be fed to pigs or other young stock profitably (see pages 21-22 of this catalog) and that a small daily loss of fat soon mounts to a staggering figure.

A few factories have tried to skim the whey by hand but have found that the cream thus produced is thin, of poor quality and makes butter with a rancid taste. Furthermore, hand skimming recovers only a small part of the fat.

Some cheese factories, being familiar with the remarkable success of De Laval Cream Separators in skimming butter-fat from milk, have experimented with former types of these machines in skimming whey. But even these separators do not give satisfactory service in cheese factories because they were designed to separate milk, which contains approximately 4 per cent fat, while whey contains only about $\frac{3}{10}$ of 1 per cent. In other words, the skimming apparatus of former types of cream separators is not adapted to separating whey.

However, the experiments in the use of older type De Laval Cream Separators in skimming whey demonstrated that with a properly designed special machine the separation could be made complete, a uniformly high test cream delivered and the machine operated for long, continuous runs.

To the problem, then, of perfecting such a separator the De Laval engineers addressed themselves, with the result that, after long experimentation and exhaustive tests, The De Laval Separator Company brought out the first efficient Whey Separator—a machine which skims to a trace; produces cream testing up to 60 per cent of fat; operates for long runs, and is most economical in the use of power.

The best evidence of the superiority of De Laval Whey Separators is the fact that these machines are used in the great majority of factories skimming whey, and that plants which have replaced other makes of whey separators with De Laval's are getting better whey cream or whey butter than ever before, realizing bigger profits and obtaining far more satisfactory service.

The new De Laval Whey Separators skim whey or milk with equal efficiency

The De Laval Separator Company, realizing that there are many combined cheese and butter factories, has so designed its new type Whey Separators that they will skim whey or milk with equal efficiency. In order to convert the whey separator into a cream separator, the user merely substitutes a special cream regulating cover, which is supplied as an extra attachment, at small cost.

For over forty years the name "De Laval" has stood for superiority in every feature of separator construction. The men of widest experience in the dairy industry, through long years of satisfactory service, have learned that complete confidence can be placed in any machine bearing the name "De Laval." Why make disappointing and expensive experiments with other machines when you know that a De Laval will last longer, cost less for upkeep, and give you more and better cream at a lower cost than any other separator?

A few examples of De Laval whey separator profits

THE De Laval Separator Company has received hundreds of letters from cheese factories telling of the big profits De Laval Whey Separators are earning for them. A few of these letters are reproduced on the following pages, but a brief summary of part of them at this point will enable the cheese factory owner or patron to grasp at once the great advantages being gained by the use of De Laval Whey Separators.

The accompanying photograph shows the Pine Island Cheese Company factory, at Pine Island, Minn. Whey cream recovered by a De Laval Whey Separator paid for this factory in three years.

Henry Matthias, one of the best-known cheese-makers in Wisconsin, writes that he sold \$410.36 worth of whey cream separated by a De Laval during the first two months he used the machine. Mr. Matthias adds that the machine skims 5,000 pounds of milk per hour and "gets all the cream." "I am more than pleased and so are my patrons," he says. "No factory should be without a De Laval Whey Separator."

All the running expenses of the North Bend Cheese Company factory, at North Bend, N. Y., are paid by the sale of whey butter churned from cream separated by a De Laval Whey Separator.

Between \$1,500 and \$1,600 is the annual profit realized on whey butter by the Alger Cheese factory, at Martinsburg, N. Y.



Pine Island Cheese Factory, Pine Island, Minn.

De Laval Whey Separator Paid for Cheese Factory in Three Years

THE DE LAVAL SEPARATOR CO.,
Chicago, Ill.

Dear Sirs:

If your representative had told us three years ago that a De Laval Whey Separator would build our new factory in three years time, we would have thought him fit for an insane asylum.

We installed a No. 1 De Laval Turbine Whey Separator in our factory in March, 1913, and since that time have made into cheese 7,908,333 pounds of milk. Our De Laval Whey Separator has returned us \$7,149.86 worth of cream. By July 1st, this year, it will actually have paid for our new factory, and our plant is a fine one, as the enclosed photograph will show.

As further proof of our appreciation of the De Laval Whey Separator, we are today giving our order for another No. 1 Turbine, as our milk receipts are growing too large to be handled by one machine.

Our De Laval Whey Separator surely has been a money-maker for us.

Yours truly,

PINE ISLAND CHEESE CO.,
Pine Island, Minn.,

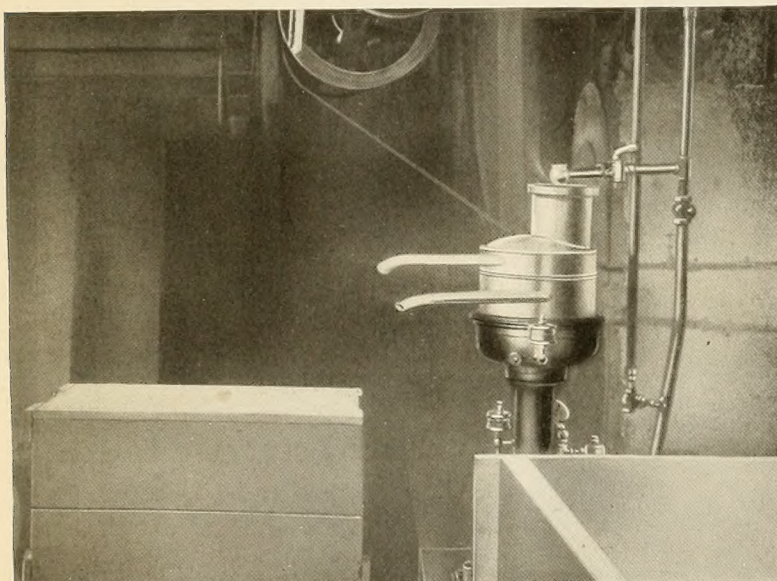
JOHN STUCKY,
Secretary and Manager.

DE LAVAL WHEY SEPARATORS

"The farmers are very well satisfied with the skimmed whey, and its feeding value is very little less than that of unskimmed whey," writes George W. Alger, proprietor of the factory. "The whey tank and milk cans are much more easily taken care of on account of the absence of grease, which always makes washing difficult when whey is not skimmed."

H. S. Channell, cheesemaker for the Bloomfield Cheese & Butter Co., of Bloomfield, Ontario, has used two De Laval Whey Separators in the Bloomfield factory for seven years and writes that he has found it "paying business."

"Putting in a whey butter plant is the wisest thing a cheese factory can do," Mr. Channell declares. "Separating the whey with a De Laval Whey Separator makes money both for the cheese factory and the patron, and, in addition, saves the patron's wife a lot of work in scrubbing out cans."



Alger Cheese Factory, Martinsburg, N. Y.

"Farmers Very Well Satisfied With Skimmed Whey for Stock Feed"

THE DE LAVAL SEPARATOR COMPANY,
New York City.

Gentlemen:

I make between \$1,500 and \$1,600 a year out of whey butter made from cream recovered by your No. 1 turbine whey separator. The farmers are very well satisfied with the skimmed whey, as its feeding value is very little less than that of unskimmed whey, and the whey tank and milk cans are much more easily taken care of on account of the absence of grease which always makes washing difficult when whey is not skimmed.

I highly recommend the De Laval Whey Separator to all cheese factories.

Yours truly,

GEORGE W. ALGER, Prop.,
Alger Cheese Factory,
Martinsburg, N. Y.

Two De Laval Whey Separators in the South Luxemburg Cheese factory, at Luxemburg, Wis., have produced as high as \$880 worth of whey cream in one month.

"We are only sorry we did not put in a De Laval Whey Separator years ago, as we can see now where we lost thousands of dollars by not having one of your machines," writes C. W. Dodge, of the Blakley Cheese factory, of Pawlet, Vt.

Considering the fact that very little additional power is required to operate it and that, in view of the increased earnings, the cost of installation is comparatively insignificant, no cheese factory, large or small, can afford to get along without a De Laval Whey Separator.

Sizes, styles and prices

DE LAVAL WHEY SEPARATORS are made in four sizes, with separating capacities of 7,000 pounds, 5,000 pounds, 3,000 pounds, and 1,350 pounds of whey per hour, respectively. All of these sizes are supplied in both Belt Power and Steam Turbine styles, as illustrated in the following pages. The No. 22-W may be operated either by hand or belt power, the Universal Power Drive (see page 15) being employed in the latter case.

Prices may be had on application to the Company, at any of its branches or to any one of its authorized dealers.

Importance of ample capacity

The operating economy, as well as influence on quality of product, through using a whey separator of ample capacity, is of such great importance that the special attention of intending buyers is called to this consideration in determining the selection of size of machine.

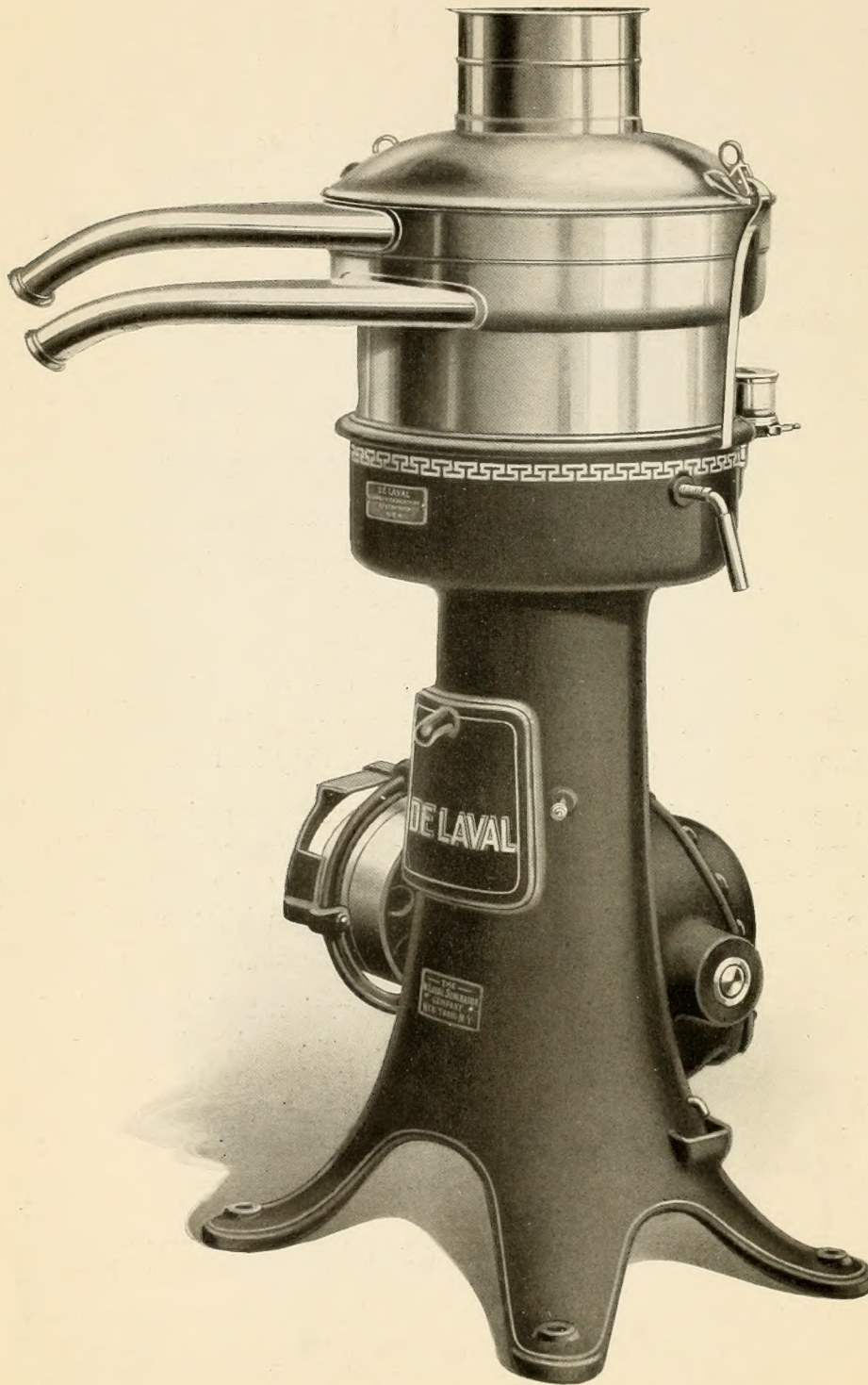
The stated capacity of a whey separator is the rate at which it will separate whey per hour efficiently. Any quantity of whey may be separated with any size of machine, according to the length of time it may be run.

A larger size machine, however, occupies no more space and costs little, if any, more for power, labor and maintenance than a smaller one, while it is of great importance in either cheese or butter factory operation to be able to separate and dispose of the whey or milk and the resulting products with the utmost facility, as every experienced operator understands.

The greater capacity of the new type De Laval machines, particularly in the larger sizes, is one of their most important features, and, aside from all other advantages, must soon lead to their replacement of all other machines and practically universal use in all cheese and butter factories.

THE DE LAVAL GUARANTEE

DE LAVAL WHEY SEPARATORS are guaranteed to be as represented and to fulfill all the claims made for them, both as to skimming whey and milk. They are sold subject to the guarantee of their unqualified superiority in every material feature of separator practicability, inclusive of the production of a greater value of cream and a greater quantity of butter of better quality than is possible through the use of any other whey or cream separator or whey or cream separating system.



New De Laval Whey Separator No. 60-W

(Belt Driven)

Actual Separating Capacity, 7000 Pounds of Whey per Hour

(Milk Separating Capacity, 6500 Pounds)



New De Laval Whey Separator No. 61-W

(Turbine Driven)

Actual Separating Capacity, 7000 Pounds of Whey per Hour

(Milk Separating Capacity, 6500 Pounds)



New De Laval Whey Separator No. 40-W

(Belt Driven)

Actual Separating Capacity, 5000 Pounds of Whey per Hour

(Milk Separating Capacity, 4500 Pounds)



New De Laval Whey Separator No. 41-W

(Turbine Driven)

Actual Separating Capacity, 5000 Pounds of Whey per Hour

(Milk Separating Capacity, 4500 Pounds)



New De Laval Whey Separator No. 30-W

(Belt Driven)

Actual Separating Capacity, 3000 Pounds of Whey per Hour

(Milk Separating Capacity, 2500 Pounds)

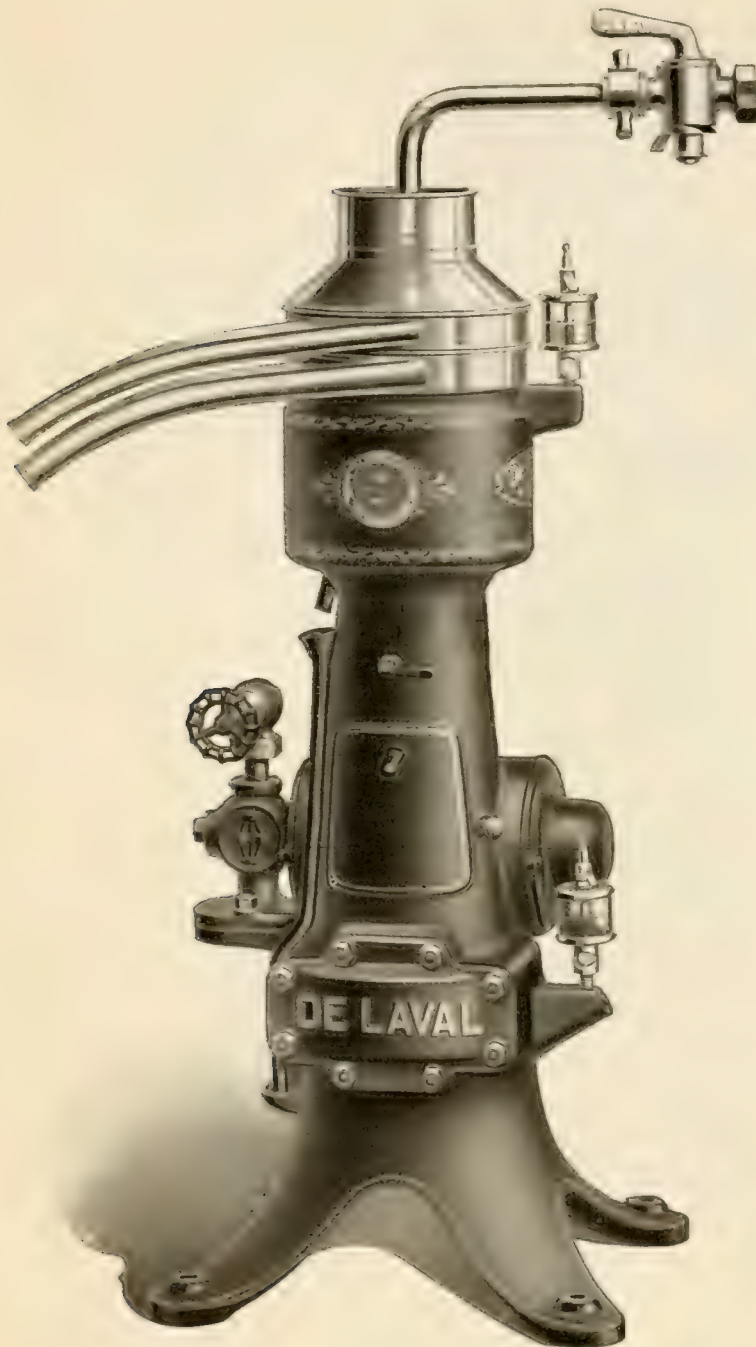


New De Laval Whey Separator No. 31-W

(Turbine Driven)

Actual Separating Capacity, 3000 Pounds of Whey per Hour

(Milk Separating Capacity, 2500 Pounds)



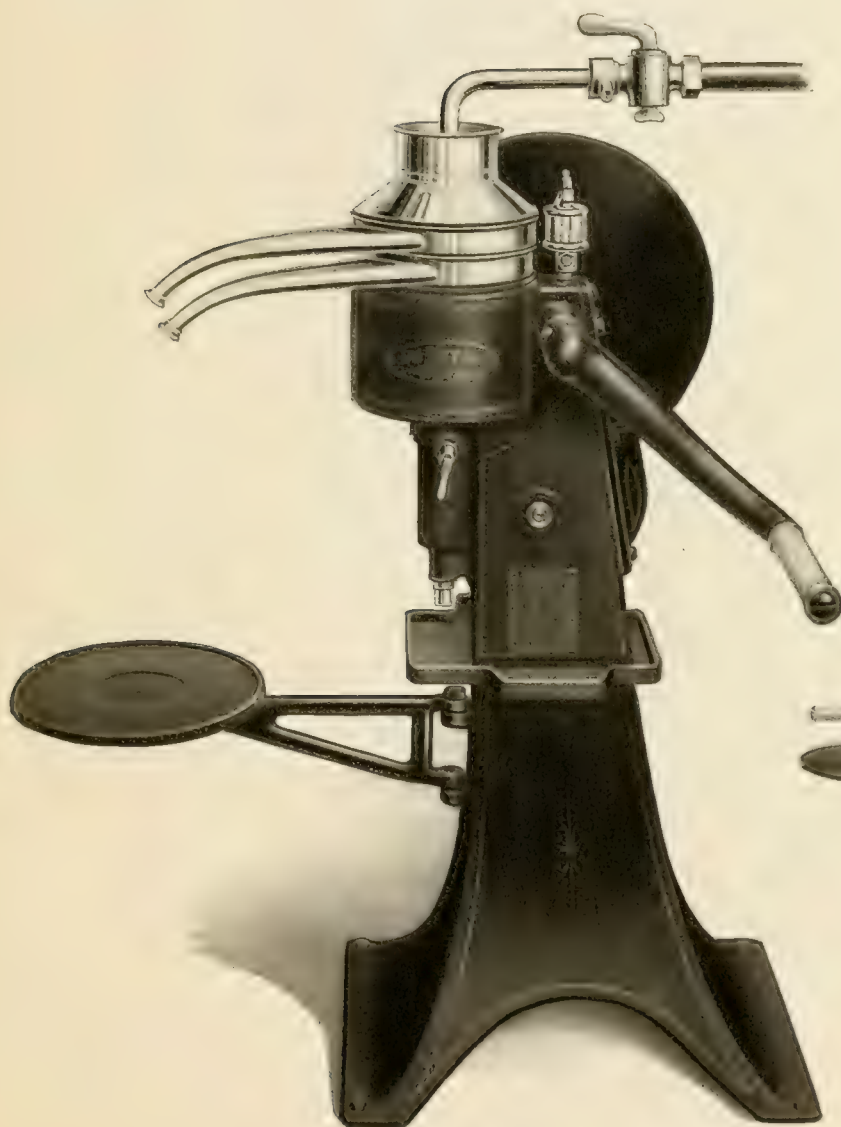
SUPPLY TANK AND STAND
FURNISHED WITH No. 25-W

New De Laval Whey Separator No. 25-W

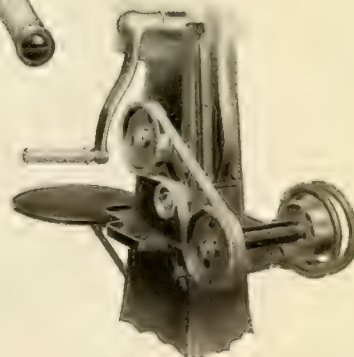
(Turbine Driven)

Actual Separating Capacity, 1350 Pounds of Whey per Hour

(Milk Separating Capacity, 1350 Pounds)



SUPPLY TANK AND STAND
FURNISHED WITH No. 22-W



UNIVERSAL POWER DRIVE

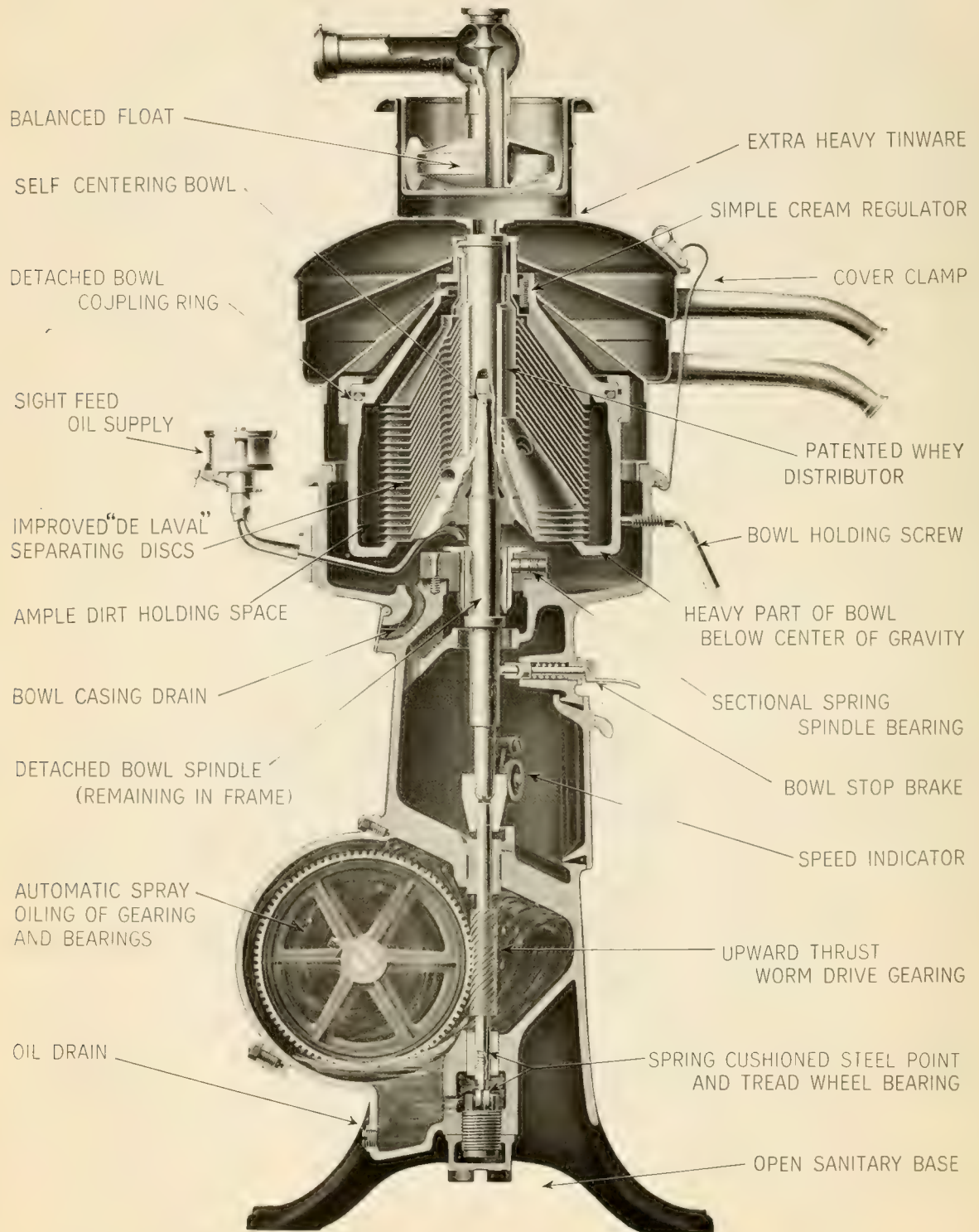
New De Laval Whey Separator No. 22-W

(Belt or Hand Driven)

Actual Separating Capacity, 1350 Pounds of Whey per Hour

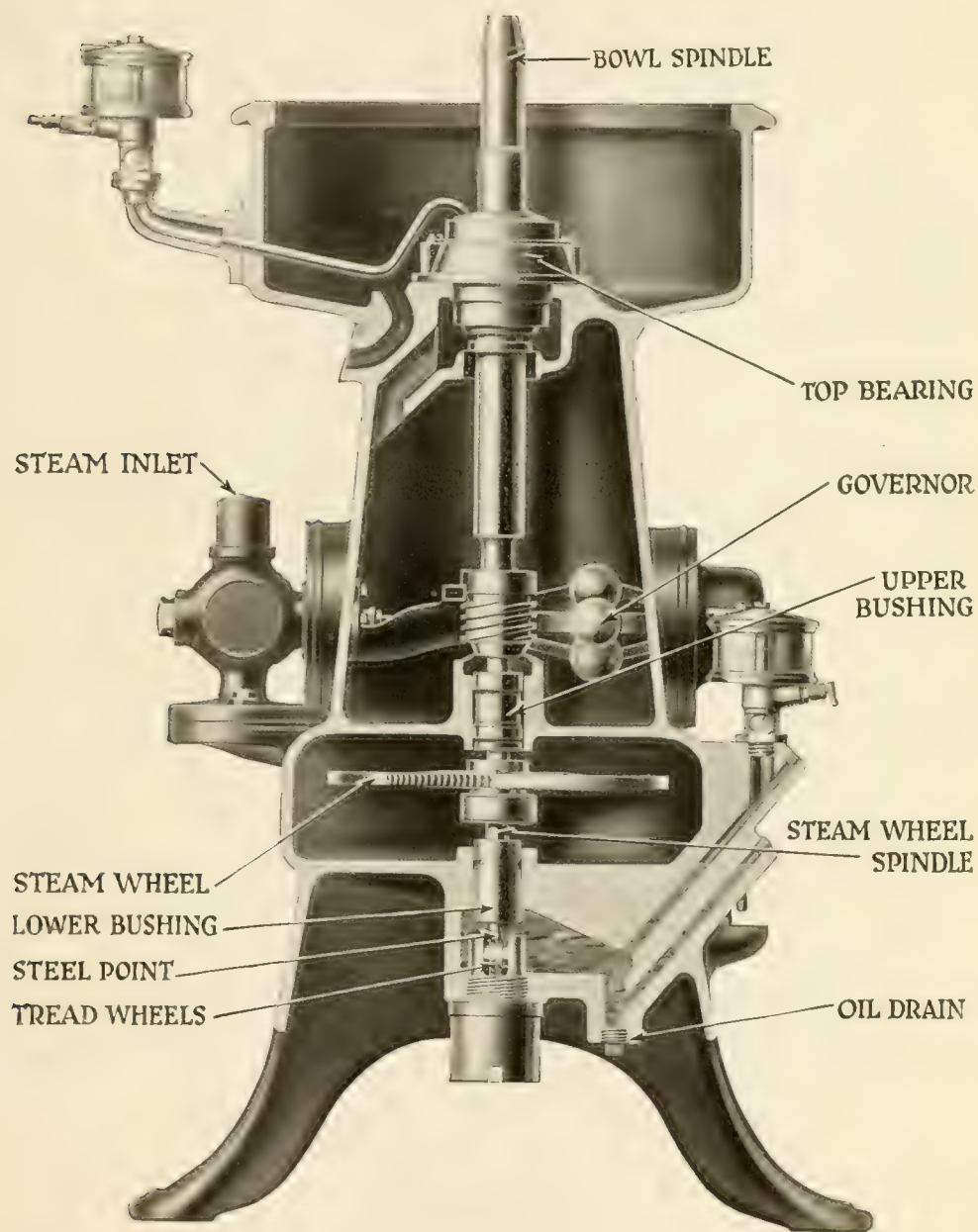
(Milk Separating Capacity, 1350 Pounds)

DE LAVAL WHEY SEPARATORS



**Sectional View Showing the Important Features of the
De Laval Whey Separator**

(Cross-sectional View of No. 60-W and 40-W Machines. See also Cross-sectional View of Bowl on page 25)



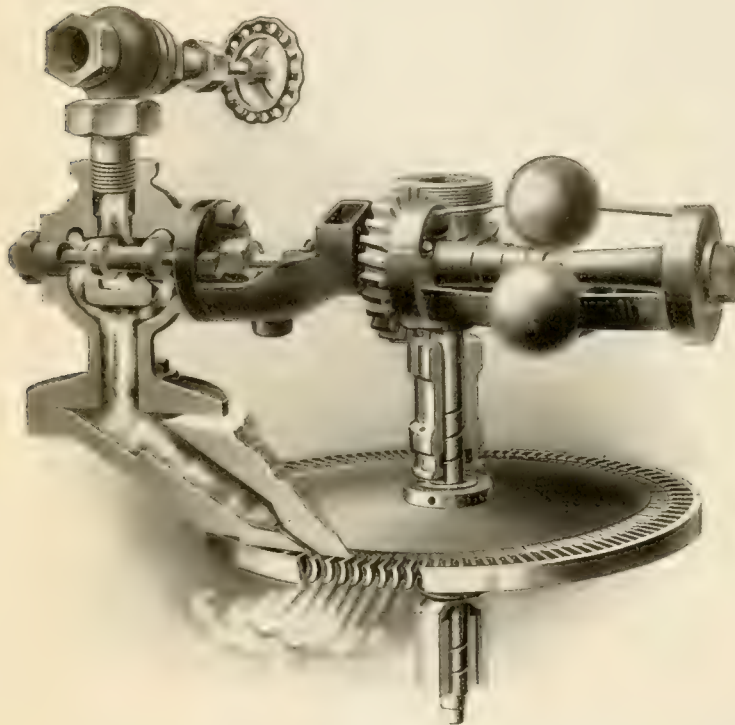
Sectional View Showing the Important Features of the
Turbine Driven

De Laval Whey Separator

Three styles of drive

IN manner of drive, both belt and turbine, the new type De Laval Whey Separators have been completely re-designed and re-constructed to reduce to a minimum the amount of power required and to insure unvarying speed.

The new turbine-driven machines are equipped with a new type of steam driving wheel, similar in principle to that utilized in the famous De Laval Steam Turbine Engines, and which is still more economical in the consumption of steam.



Steam driving wheel (with section of rim cut away to show the steam impulse buckets) and important speed and steam pressure governing mechanism of the new type De Laval Turbine machines

An important new feature of this machine is the improved type of steam governor, similar in principle to that used on high-class steam engines and which perfectly controls the steam pressure, thus insuring unvarying speed, as well as safety, in operation.

The method of driving the new belt power machines is radically different from that previously employed in power separator operation, being now accomplished through direct belt connection, by a two-inch flat belt, with tight-and-loose pulleys which are a part of the separator itself. The necessary multiplication of bowl speed is obtained through the use of

worm gearing of the most approved type encased within the frame of the machine. The use of the intermediate or jack, heretofore employed with a connecting rope belt, to the frame of the separator is thus done away with, and there is no longer any likelihood of belt slippage or variation in bowl speed for this reason, the new worm gear drive being positive and unvarying.

The New No. 22-W Whey Separator, which is adapted to the needs of cheese factories with a very small output, may be operated either by hand or belt power. In the latter case the power is applied by means of the De Laval Universal Power Drive, a patented attachment which is designed to be used only on De Laval machines.

The Universal Drive may be easily understood by reference to the illustration on page 15. The power is transmitted by belt to the tight-and-loose pulley,

provided with a belt shifter, thence from the short counter-shaft, which is a part of the Drive, by an endless belt (without hooks, rivets or lacing) to the lower or worm wheel shaft of the separator.

The particularly novel feature of the Universal Drive is the coiled spring belt tightener which is applied to the tight side of the belt, and which automatically absorbs all shocks resulting from gas engine explosions and the irregularities of speed occurring from one cause or another with almost every kind of driving power.

A complete line of specially adapted electric motors is likewise supplied for De Laval machines of the smaller sizes, and constitutes an excellent method of power driving wherever electric power is available.

Loss of butter-fat in whey

UNLESS a cheese factory is equipped with a good whey separator, most of the butter-fat in the whey is lost. In making American, or Cheddar, cheese the loss is fully equal to that suffered in skimming milk by the old-fashioned "gravity" process, before the introduction of the De Laval Cream Separator. In the manufacture of the so-called "foreign" cheese, the loss of fat is even greater.

One thousand pounds of whey from American cheese contain approximately 3 pounds of butter-fat. Whey from brick cheese is fully as rich in butter-fat, and in making Swiss cheese the loss amounts to practically 10 pounds per 1,000 pounds of whey.

"There is enough fat in whey at American cheese factories to make from 10 to 20 pounds of butter a year from each good cow contributing to the factory," says Wisconsin Agricultural Experiment Station Bulletin 246. "Factory patrons, therefore, must choose between leaving part of the fat in the whey tank, cans and hog trough, or saving practically all of the fat by means of a whey separator."

One of the most striking demonstrations of the loss of butter-fat in whey was an exhibit prepared by the University of Wisconsin Dairy School and placed on view at a Wisconsin State Fair.

In the background of the exhibit (see photograph on next page) were arranged 80 butter-tubs which represented the amount of butter made in a year from the fat recovered from whey in an American cheese factory receiving an average of 4,000 pounds of milk daily. The chart in front of the tubs, and which is reproduced below the photograph, shows that the butter-fat lost in a factory of that capacity through not separating the whey would make 4,800 pounds of butter in a year. At 60 cents a pound the butter would have brought \$2,880 in additional profits to the factory's owners. (The market price of 25 cents a pound indicated on the chart prevailed five years ago, when the exhibit was put up.)

A chart, which was a part of the exhibit, showed that one year's fat losses in unseparated whey in an American cheese factory in Sauk County, Wisconsin, re-

ceiving an average of 5,000 pounds of milk a day during the flush of the season, amounted to 2,254.5 pounds. At the present butter-fat price this would represent more than \$1,350.

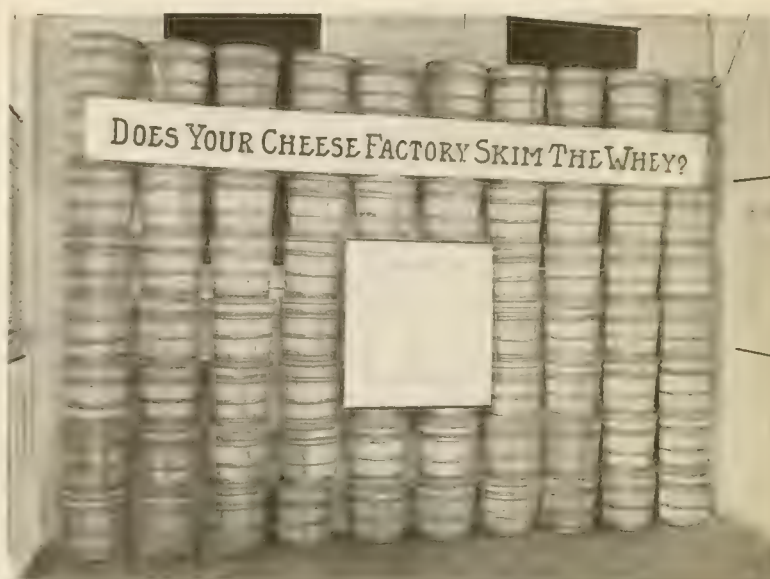
In other words, over \$1,350 which might have been added to the year's earnings was practically wasted because the factory either did not realize the loss it was standing or failed to take the necessary steps to prevent it.

As the University of Wisconsin advised on its charts, "Figure it out for your own factory at the present prices."

Is it good business to let this waste go on?

A De Laval Whey Separator, by saving the butter-fat in whey, closes the door on waste which no cheese factory can afford, and thereby opens the door to handsome additional profits.

University of Wisconsin Dairy School Exhibit at State Fair



Is Whey Skimming Profitable?

These 80 tubs represent the amount of butter made from the fat recovered from the whey at a factory making American cheese, receiving about 7,000 lbs. of milk per day during the flush of the season—about 2,000 lbs. per day during the winter—or an average of 4,000 lbs. per day for the entire year.

Daily	Annually
4,000 lbs. Milk.....	1,460,000 lbs.
3,000 " Whey.....	1,314,000 "
27 " Whey Cream.....	9,855 "
10.8 " " Fat.....	3,942 "
13.2 " " Butter.....	4,800 "
\$3.30 Market Value.....	\$1,200.00

Figure it out for your factory at the present prices.

The De Laval Whey Separator conserves feeding value of whey

CHEESE factory patrons sometimes object to separating the whey, in the erroneous belief that, in this way, a good share of its feeding value is removed.

As a matter of fact, the butter-fat constitutes only a very small part of the feeding value of whey, and which, when taken out, may be satisfactorily and profitably replaced, at approximately one-tenth its market price, by various meals.

Moreover, if the fat is not separated, it indirectly plays a large part in causing the whey to sour and, consequently, the milk sugar—the chief feeding element in whey—to turn to lactic acid, which is valueless as feed.



In most factories the whey is left in the vat overnight. If the whey has not been separated, about three-fourths of the fat has risen to the top by morning, and when the vat is emptied, most of the fat sticks to the sides and bottom and forms a greasy, oily scum.

If the cheesemaker does not promptly and thoroughly wash the vat, this scum soon becomes rancid and acts as a starter for each day's fresh whey.

If it were not for this grease (fat), which would be removed by a whey separator, the whey usually would stay sweet and the pigs and other young stock would get the milk sugar. As it is, they nearly always get only lactic acid, because the whey is sour when fed.

Now as to the actual feed value of the butter-fat.

One hundred and twenty-five gallons of unseparated whey from American cheese contain approximately 3 pounds of butter-fat. Therefore 4 gallons—an average day's ration for a pig or calf—contain about $1\frac{1}{2}$ ounces. But only about one-fourth reaches the animal. As was previously explained, most of the other three-fourths, having come to the top during the night, sticks to the inside of the vat when the whey is drawn off. Thus a pig or calf gets only about three-eighths of an ounce of butter-fat in drinking four gallons of unseparated whey, a very small amount indeed.

In answer to the question of the feeding value of the fat in whey, the Wisconsin Dairy School exhibited at a Wisconsin State Fair eight bottles containing the solids in two gallons of separated and unseparated whey. (Refer to the accompanying photograph.) These bottles show that two gallons of separated whey contain eight-tenths of a pound of milk sugar, one-seventh of a pound of protein and one-eighth of a pound of ash, just as does the unseparated whey, the only part removed by the separator being one-twentieth of a pound of fat.

**University of Wisconsin Dairy School Exhibit at
State Fair**

Is Separated Whey Good Food *for Hogs?*



Separating the Whey removes only $\frac{1}{20}$ of the Whey Solids

In answer to the question as to the feeding value of separated whey, the Wisconsin Dairy School displayed at a Wisconsin State Fair these bottles, which contain the solids in two gallons of separated and unseparated whey. It will be seen that the separated whey contains $\frac{8}{10}$ lb. of milk sugar; $\frac{1}{7}$ lb. of protein and $\frac{1}{8}$ lb. of ash, just as does the unseparated whey, the only part removed being $\frac{1}{20}$ lb. of fat.

This demonstrates that most of the feeding value of the whey is in the milk sugar, which remains in the whey after it is passed through the separator.

Fred Marty, former deputy state dairy commissioner of Wisconsin, and recognized as one of the leading authorities in that state on cheesemaking, answers the question of the feeding value of the fat in whey in the following words:

"Whey contains about seven per cent of solids; fat .35 per cent; nitrogenous substances .85 per cent; ash, sugar and so forth, 5.8 per cent. The fat is worth



Henry Matthias' Cheese Factory, Owen, Wis.

about one-tenth as much food value as the sugar present; it is worth one-third as much as the albumen, so that taking fat out of the whey amounts to removing relatively about one-fifteenth of the feeding value of whey, provided the patrons get all of the fat present in whey when it comes from the vat. But they do not get it all; the fat rises to the surface and unless some patron takes the trouble to skim it off, amounts to practically nothing, as it is lost in careless handling."

"I Have Sold \$410.36 Worth of Whey Cream in Two Months; Can Hardly Believe It"

THE DE LAVAL SEPARATOR CO.,
Chicago, Ill.

Dear Sirs:

I installed one of your No. 1 Turbine Whey Separators on April 4th, 1917. To date I have sold \$410.36 worth of cream recovered from 425,000 pounds of milk. I can hardly believe it, but figures don't lie.

The machine skims 5,000 pounds of milk per hour and gets all the cream. I am more than pleased and so are my patrons. No factory should be without a De Laval Whey Separator. It takes very little additional fuel and I can wash up the machine in 15 minutes.

I assure you that you can count on me as a strong De Laval booster.

Yours truly,

HENRY MATTHIAS,
Owen, Wis.

It will thus be seen that a De Laval Whey Separator takes very little indeed from the feeding value of whey. At the same time, by removing the butter-fat, it goes a long way in helping the cheesemaker keep the vat in such condition that the whey stays sweet and the pigs or other young stock get the milk sugar, which in reality is what makes whey useful as a feed for livestock.

And, in addition, the butter-fat, which otherwise would be lost, may be readily sold for human food at a good profit.

Considerations in the selection of a Whey Separator

THE chief considerations in the selection of a Whey Separator, from the standpoint of the average cheese factory, may be briefly summarized as follows:

Thoroughness of Separation. When it is remembered that there is only about 3/10 of a pound of butter-fat in 100 pounds of whey, the great importance of clean skimming is apparent. The loss of even a small amount of fat in separation materially reduces the profit. De Laval Whey Separators skim *clean*. (See pages 27 and 28.)

Quality of Cream. "In making whey butter it is desirable to separate cream containing at least 50 per cent fat, so that 75 to 100 per cent starter may be added before churning," says Wisconsin Agricultural Experiment Station Bulletin 132. De Laval Whey Separators produce a uniform cream testing 50 per cent fat, or more. (See pages 28 and 29.)

Length of Runs. No cheesemaker has the time to stop the machine frequently to clean curd out of the bowl. De Laval Whey Separators may be operated for long, continuous runs. (See page 29.)

Capacity. The whey separator's capacity must be conservatively rated so that the separation will be thorough under all skimming conditions. The capacities of De Laval Whey Separators are so rated. (See page 29.)

Power Required. The machine must be economical in the consumption of power. De Laval Whey Separators use less than half the power consumed by other separators in skimming like quantities of whey. (See page 29.)

Simplicity. There must be nothing about a whey separator not easily handled; nothing complicated or likely to require adjustment; no need of expert knowledge or special tools. De Laval Whey Separators are the simplest separators made. (See page 30.)

Ease of Cleaning. The machine must be capable of easy and thorough cleaning so that it may be kept sanitary. De Laval Whey Separators are the easiest to wash. Every part is easily accessible. (See page 30.)

Durability. The construction of a whey separator must be such that it will give first-class service for years, not easily get out of order or require attention on account of wear, and cost little for repairs. De Laval Whey Separators outlast other makes of whey separators by many years. (See page 30.)

Field Service. The user should be able to obtain practical help from an experienced separator man not only in setting up and starting a whey separator but at any time later, if required; also to obtain surely and promptly any repair part that may be needed. (See page 32.)

Price. The last and least consideration in purchasing a whey separator is the price. The fairness of the price depends on the service and the profits the user gets out of the machine; not the money he puts into it.

The new De Laval feed device

(In 40-W—41-W—60-W and 61-W Bowls)



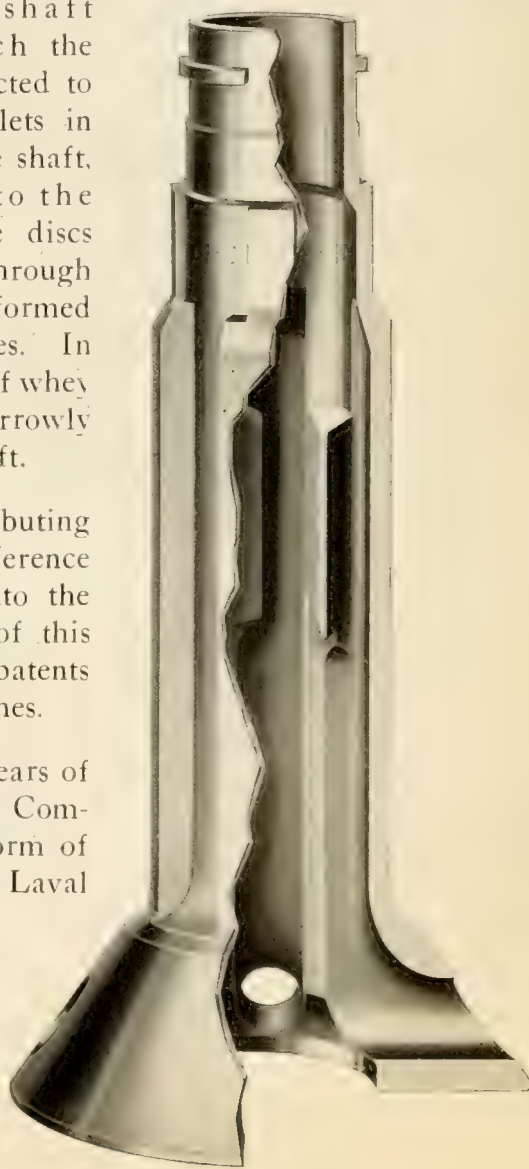
Cross-sectional view of new De Laval feed shaft through which the incoming whey is delivered to the separating discs. This form of construction greatly facilitates the distribution of a larger amount of whey through a shaft of given size than would otherwise be possible.

In the previous "split-wing" shaft, the method of whey distribution to the discs was through narrowly slotted projecting wings on the receiving shaft.

The new receiving shaft and distributing device, the precise design of which with reference to the feeding shaft and of its outlets into the separating discs is an important feature of this new bowl construction, is fully protected by patents which limit its use to the De Laval machines.

It has already been proved by several years of experiments and tests which the De Laval Company has been conducting that this new form of bowl construction now introduced in the De Laval machines is as much of an improvement over the previous "split-wing" type of feed shaft construction as was the "split-wing" construction over the methods of bowl feed in use prior to 1900. The greater capacity and other advantages mentioned speak for themselves, and the more sanitary construction will be self-evident to all experienced separator users.

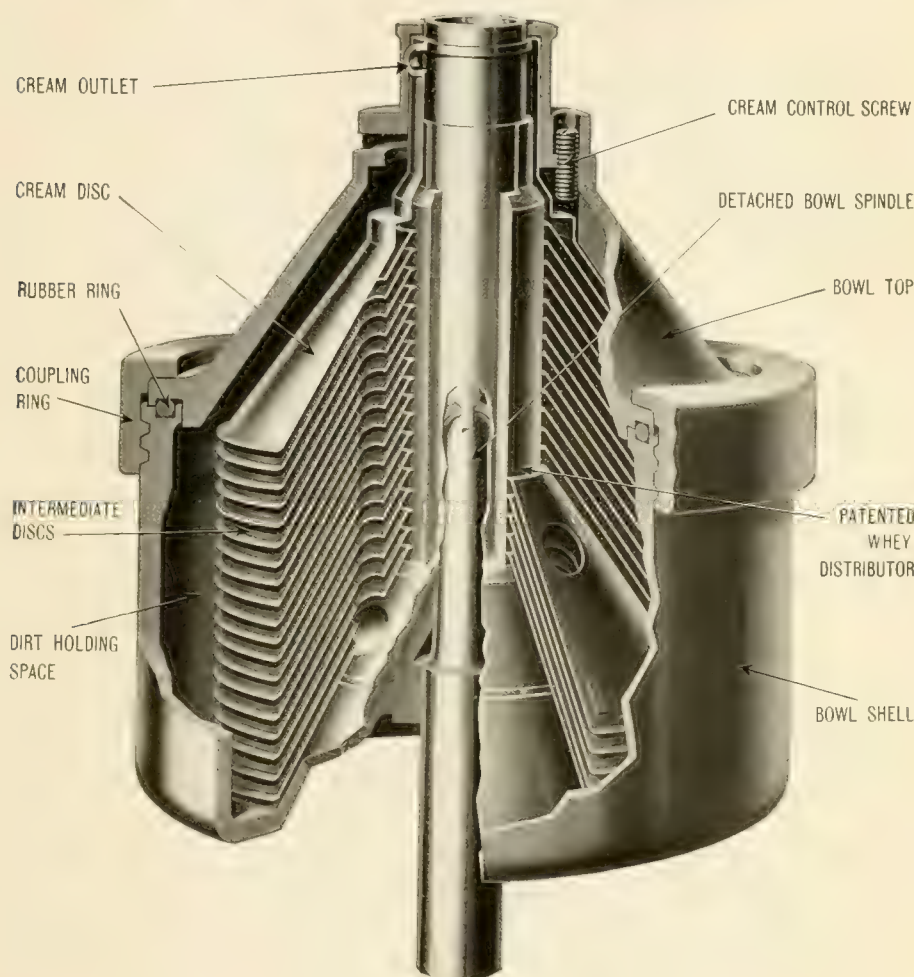
As will be observed by referring to the accompanying illustration and to the sectional view of the complete bowl shown on page 25 of this catalog, the distribution of the whey from the receiving shaft into the separating discs is now accomplished by channels within the receiving shaft through which the whey is conducted to the radial outlets in the base of the shaft, and thence to the orifices in the discs and upward through the passages formed by these orifices. In



Sectional half-view of the new whey-receiving shaft and distributing device

The De Laval Whey Separator Bowl

(In 40-W—41-W—60-W and 61-W Whey Separators)



**Sectional view of 5000 and 7000 lb. type of
New De Laval Whey Separator Bowl**

The new De Laval Whey Separator is re-designed to meet in every detail the requirements disclosed by long experimentation and test. It gives perfect results when skimming either whey or milk.

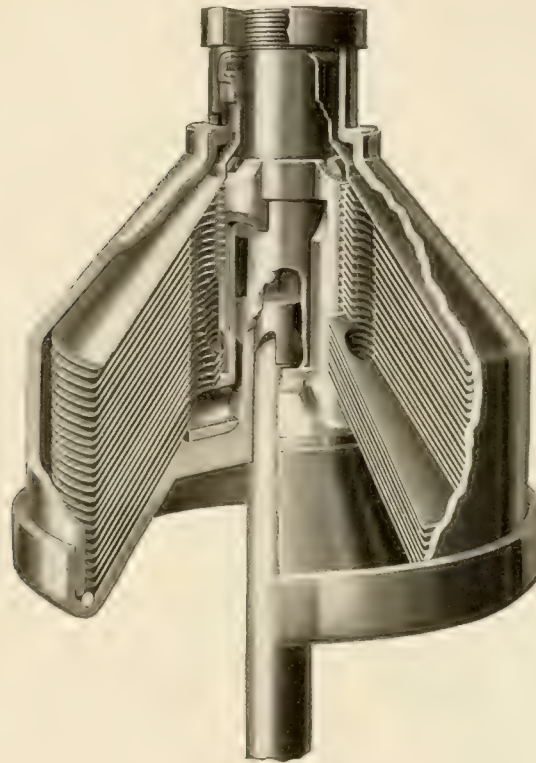
Among the important improvements is the new patent-protected receiving shaft, which conveys the liquid to be separated by means of channels within the shaft to the radial outlets at the base of the shaft, and thence to the orifices in the discs and upward through the passages formed by these orifices. (See page 24.) This, in connection with the other superior features of design, gives the bowl greater capacity and increased separating efficiency.

Other improvements are the larger curd or dirt-holding space; the small-diameter bowl neck, which through its cream discharge outlet delivers the cream near the center of revolving motion, thus insuring a better quality of cream; the new method of coupling top to bowl body; the detached bowl spindle, always remaining in frame; the less driving power required in proportion to capacity, because the bowl is self-centering and of exactly the proper design and proportions, and revolves at lower speed and with less frictional resistance.

(See also sectional view on page 26)

The De Laval Whey Separator Bowl

(In 30-W and 31-W Whey Separators)



Sectional view of new style 3000 lb. De Laval Whey Separator bowl

This illustration shows the difference in shell construction, particularly from the larger No. 40-W—41-W and No. 60-W—61-W bowls shown on previous page

IN the smaller size and hence smaller diameter new bowls the cream regulation is effected by adjustment of the proportionate cream delivery, as is done in the latest improved De Laval Dairy size machines, this method of regulation being entirely practical and equal to any other within such limit of bowl size.

The new type bowl is supported by its spindle at a point well above its center weight, with the greater part of its revolving weight overhanging the point of spindle support as well as the top or neck bearing.

This construction saves power in driving, insures a smoother running machine and minimizes any likelihood of the bowl getting out of balance or running out of true, with consequent vibration detrimental to the efficiency of the separation and greatly increasing the wear of the supporting parts of the frame.

Why De Laval Whey Separators are superior to other whey and cream separators

DE LAVAL WHEY SEPARATORS skim closer and produce better quality cream, when skimming either whey or milk, because of the superior design and construction of the De Laval bowl, which makes use of the De Laval discs, newly perfected whey or milk distributing device and other features which competing separators may not employ because of protecting patents. The De Laval Whey Separator bowl possesses the maximum degree of efficiency, capacity and all-around separator practicability.

Being self-centering, of the exactly proper design and proportions, and revolving at a much lower speed than the bowls of other separators, it operates with the least frictional resistance, in this way requiring the least driving power in proportion to capacity.

In short, there is a complete coordination of all the many factors which constitute the perfect separator bowl.

The De Laval disc system of separator bowl construction consists of placing in the bowl a series of round, sloping, conical steel discs or plates, one above the other, and spaced slightly apart by thin calks or ribs fastened to the upper side of the discs.

Fed into the center of the bowl, the liquid to be separated is conducted by properly arranged channels to a distributing point or "neutral zone."



H. A. Kalk's Cheese Factory, Sheboygan Falls, Wis.

Used De Laval Whey Separator Four Years; Has Never Missed a Skimming

THE DE LAVAL SEPARATOR CO.,
Chicago, Ill.

Gentlemen:

I have been using a No. 1 De Laval Whey Separator for four years and have never missed a skimming. It skims to 1/100 of 1 per cent of the butter-fat in whey. I must say that I do not use over 4 gallons of De Laval Oil a year on my machine.

I am mighty well pleased with the De Laval Whey Separator and recommend it to any cheese factory.

Yours truly,

H. A. KALK,

Sheboygan Falls, Wis.

From this point it is evenly distributed in thin sheets or layers between the discs, being thus subjected to the centrifugal or "out-from-the-center" force created by the revolving speed of the bowl, instead of in a solid mass as is the case in certain other types of separator bowls. The De Laval disc system insures a more perfect separation with a very much less bowl speed than is possible with other separators, and leaves the butter-fat globules in their natural condition. Breaking up the fat globules not only impairs the quality of the cream or the butter made from it, but involves a loss of butter-fat in churning.

The whey or milk-distributing devices in both the new and old type machines feed the liquid into the separating zone *beyond the cream wall* and insure the flow of the cream to the discharge outlets without coming in contact either with



Maple Leaf Cheese Factory, Tillamook, Ore.

Three Largest Cheese Plants in U. S. Are Pleased with De Laval Whey Machines

DE LAVAL DAIRY SUPPLY CO.,
San Francisco, Cal.

Gentlemen:

We are using your De Laval Separators in our Maple Leaf, Tillamook and Fairview factories, which probably are the three largest cheese plants in the United States. The average receipts of milk per day at each factory during the flush of the season are 25,000 pounds. We are pleased to say that your machines are giving good satisfaction.

Yours truly,

CARL HABERLACH,
Tillamook, Oregon.

the partially separated or incoming whey or milk. This adds further to the thoroughness and rapidity of the separation. No other make of separator may use these De Laval patent-protected distributing devices.

This insures the delivery of cream of smoother, more even texture than that produced by separators of other makes.

The cream regulating device of De Laval Whey Separators may be so adjusted that the machine will separate cream testing 15 to 60 per cent fat, as may be desired.

In addition to the bowl parts mentioned above, there are numerous other patent-protected features vital to the construction of an efficient separator bowl and which can be used only in De Laval machines.

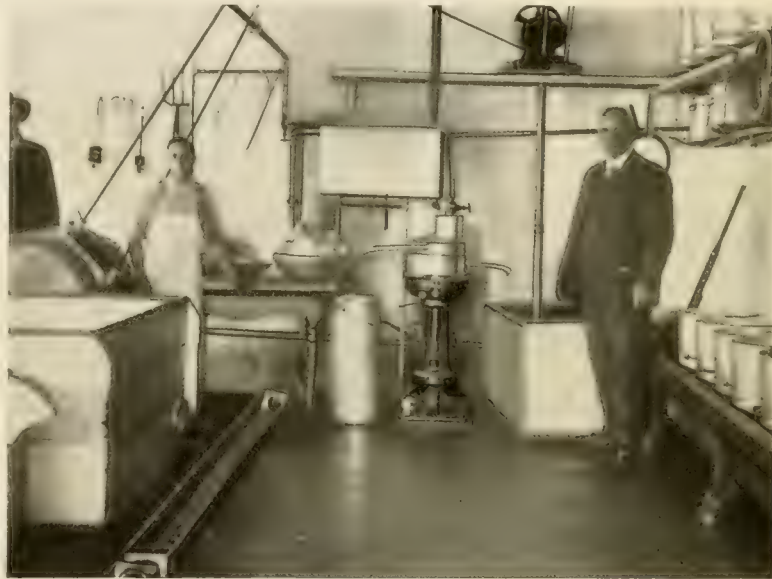
In the design and construction of the De Laval Whey Separator bowls ample provision has been made for curd or dirt-holding space, thus enabling a continuous run of long duration, even though the whey or milk may not be in the best of condition.

The capacity of De Laval Whey Separators—the rate at which they will skim whey or milk—greatly exceeds that of other separators, due to the fact that in determining the capacity of De Laval machines allowance always is made for unfavorable conditions of the whey or milk, such as will unavoidably be encountered in greater or less degree in practical use. This is not the case, however, with other makes of separators.

Superiority of design and construction, low speed and superior lubrication make De Laval machines the most economical in the consumption of power—in fact, they use less than half the power consumed by other separators in skimming a like quantity of whey or milk. (See also page 6.)

De Laval Whey Separators operate at from 6,000 to 7,000 revolutions per minute, as compared with the speed of 8,000 to 15,000, or even more, of competing makes of whey or cream separators.

Machines of the new type are automatically lubricated, every running part being bathed constantly in a film of oil. Thus all the metal surfaces are practically cushioned in oil. The wear is thus reduced to the absolute minimum.



Mountain View Cheese and Butter Factory, Belleville, Ont

Whey Butter Pays All Running Expenses of This Cheese Plant

THE DE LAVAL SEPARATOR CO.,
New York.

Gentlemen:

One year ago last April we purchased a De Laval Turbine Whey Separator. In the flush of the year we take in from 5,000 to 6,000 pounds of milk a day and make 3 pounds of butter to 1,000 pounds of whey. We sell all the butter we can make at market prices right here at home.

A sure way to make a cheese factory pay bigger is to separate the whey. The whey butter pays all the running expenses of our plant. We would advise all cheese factories to put in De Laval Whey Separators.

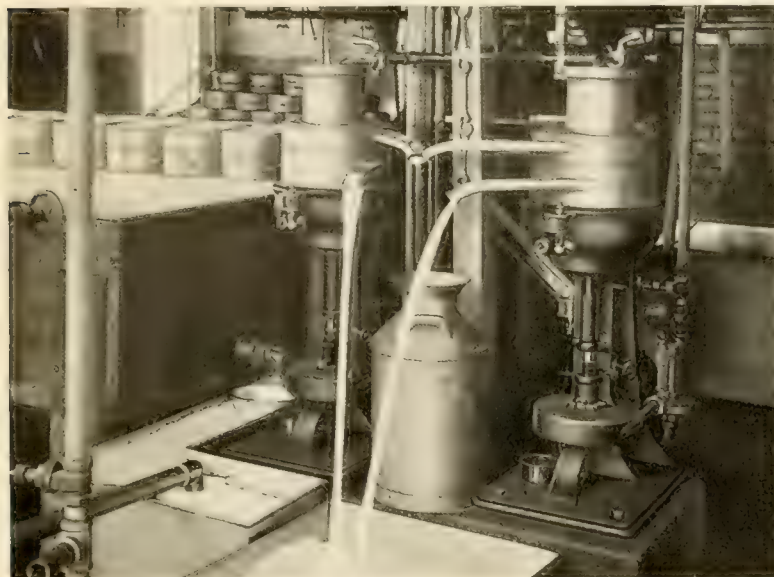
Yours truly,

NORTH BEND CHEESE COMPANY,
Isaac N. De Kalb,
North Bend, N. Y.

DE LAVAL WHEY SEPARATORS

There is nothing about the operation, adjustment or repair of De Laval Whey Separators which requires expert knowledge or special tools. There are no parts of which adjustment is frequently necessary to maintain good running or to conform to the varying conditions of everyday use. There is no need of greater skill than the ordinary cheese factory employe readily possesses. There are no delicate, fragile parts, easily broken or likely to get out of order.

Such simplicity likewise makes the machines the easiest to clean. Every surface of the bowl is smooth and all the parts are easily accessible. The frames are simple, smooth-surfaced and free from recesses. The running parts are so protected that neither whey, milk nor water can reach them.



South Luxemburg Cheese Factory, Luxemburg, Wis.

Whey Cream Profits Ran as High as \$880 per Month; No Repair Costs

THE DE LAVAL SEPARATOR CO.,
Chicago, Ill.

Gentlemen:

The two No. 1 De Laval Whey Separators we bought four years ago have skimmed over twenty million pounds of whey. Our run during the summer months is nearly 30,000 pounds daily with whey cream receipts as high as \$880 a month.

We have had excellent service both from the machines and the De Laval Company. The machines have never missed a skimming, and with little repair cost.

SOUTH LUXEMBURG CREAMERY CO.,
per John Daniel, Sec'y.,
Luxemburg, Wis.

Experience has proved that the durability or life of De Laval Separators is practically unlimited. Thousands of the older type have been in use 15 to 25 years, and are today giving satisfactory service. The new De Laval Separators possess all the superior features which have enabled the older types to give such long and uniformly excellent service, and in addition embody many improvements which make for still greater efficiency and durability.

As regards the cost of maintenance and repairs, it is a widely recognized fact that there is no separator of any kind that performs as great or exacting service with as little cost for upkeep and repairs as the De Laval Whey Separator.

De Laval superior conditions of manufacture

IT is no mere freak of fortune that no one else has been able to make as good a separator as the De Laval, although many have tried.

First in the business, to begin with, The De Laval Separator Company speedily gathered together an exceptionally competent organization of skilled engineers and practical manufacturers, to which it has added from time to time, all the while concentrating the talents and faculties of this great organization on just one thing—the building of the best separator possible and the devising of means for its further improvement.

De Laval Separators, far from being the product of any one factory or any one country, are the product of a dozen closely allied shops in as many countries, each factory constantly exchanging with the others ideas and experience in manufacturing and service.

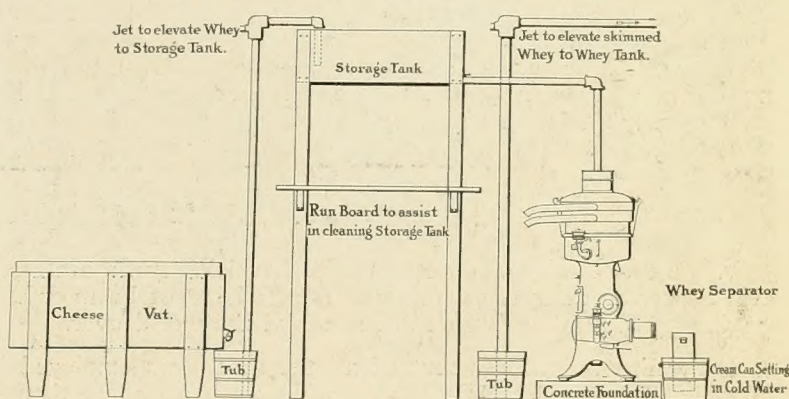
The De Laval shop buildings and equipment are the best of their kind, and always kept up-to-the-minute. The De Laval workmen are, as a rule, expert mechanics, the majority of them trained by long service with the Company.

Every part of every De Laval machine is made of the best materials obtainable and then scientifically measured for accuracy, some parts down to one-thousandth of an inch. Every separator undergoes a practical running test before leaving the factory.

The name "De Laval" on a separator has stood for nearly half a century and stands today for superiority in every feature of separator design and construction.

University of Wisconsin Dairy School Exhibit at State Fair

Plan for Separating Whey at Cheese Factory



All piping should be as short as possible—Sanitary or Galvanized piping preferred. Piping should be put up so that it can be easily taken down and cleaned

Care of Whey Cream at Cheese Factories

- (1) The separator should be adjusted so that the cream will test at least 50% fat.
- (2) As the cream comes from the separator it should run into a narrow can standing in cold water.
- (3) As soon as the separation is finished, the cooled cream should be placed in a well-aired refrigerator or set in cold water in a clean, airy room.
- (4) Where possible, the cream should be pasteurized.
- (5) Warm cream should never be mixed with cold cream.
- (6) The "white" whey and "drippings" should not be mixed with the cream, but should be heated to 150 deg. F., cooled and then held until the next day, when it should be mixed with the fresh whey and the fat separated from it.
- (7) Where the cream is being sold and not made into butter, it should be delivered daily to the shipping point. Where this is impossible, it should be delivered every other day.
- (8) The cream should never be put in the shipping cans until just before taking it to the station.
- (9) At all times only well tinned containers should be used.

De Laval field service to users

A CONSIDERATION of utmost importance to whey separator users is the ability readily to obtain parts and repairs needed at any time, and still further what may be termed field service. No matter how well made a machine may be, parts will have to be replaced from time to time, due to carelessness or unusual conditions of operation.

The De Laval Separator Company, and its large number of authorized whey separator dealers throughout the United States and Canada, carry at all times a complete stock of all parts for every type of machine. These parts are shipped promptly on receipt of orders, so that no owner of a De Laval machine need suffer a delay in making replacements.

The full significance of the De Laval field service to whey separator users may be appreciated when it is understood that the dealers just mentioned are skilled in the proper installation and operation of De Laval machines, and that there are De Laval traveling employes in every state in the United States and every province in Canada giving their entire time and attention to the sale of De Laval machines, and the care and best use of those already sold, no matter how long they may have been in use. These men's services are at the disposal of De Laval users at any time they may be found necessary.

Other De Laval machines

While this catalog is devoted to De Laval Whey Separators, it is well known that The De Laval Separator Company manufactures a full line of Farm or Dairy Size and Power or Factory Size Cream Separators, which are standard the world over.

Fully ninety-eight per cent of all the separators employed in creameries and milk plants throughout the world are De Laval's, while there are more than 2,500,000 De Laval Farm and Dairy Size Cream Separators in daily use—more than of all other makes combined.

In recent years the Company has extended its unequalled engineering resources and manufacturing facilities to the development and production of a number of special centrifugal machines.

Among these other machines are the De Laval Centrifugal Milk Clarifier, which removes from milk all sediment and objectionable matter, as well as numerous harmful bacteria; the De Laval Centrifugal Emulsor, used in the production of normal cream or milk from their component parts; the De Laval Yeast Separator, now almost universally used in the manufacture of yeast, and various other special centrifugals for the separation and recovery of oils from water, the clarification and filtration of varnishes, oils, syrups, juices, extracts, pharmaceutical preparations, and numerous other liquid commodities. Special catalogs covering any of these subjects will be mailed on request.

THE DE LAVAL SEPARATOR COMPANY

General Offices: 165 Broadway, New York

Chicago

The De Laval Separator Co.
29 E. Madison Street

Peterboro

The De Laval Company, Ltd.
113 Park Street

San Francisco

De Laval Dairy Supply Co.
61 Beale Street

Winnipeg

The De Laval Company, Ltd.
128 James Avenue

Vancouver

The De Laval Company, Ltd.
1168 Homer Street

Montreal

The De Laval Company, Ltd.
21 St. Peter Street

Quebec

The De Laval Company, Ltd.
22 St. Jacques Street

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